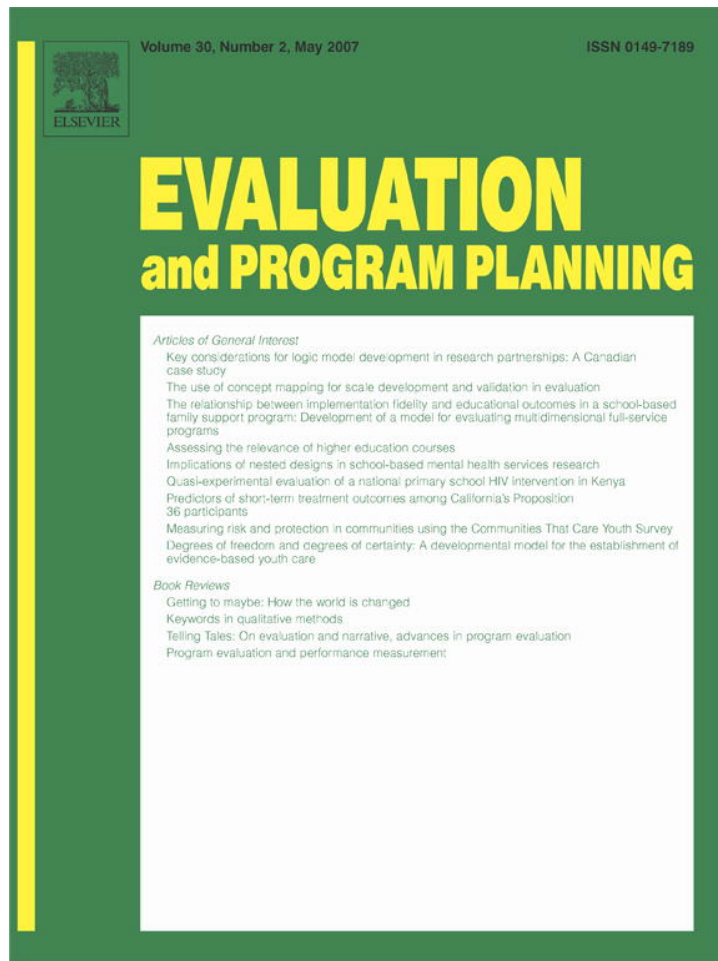


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# Quasi-experimental evaluation of a national primary school HIV intervention in Kenya

Eleanor Maticka-Tyndale<sup>a,\*</sup>, Janet Wildish<sup>b</sup>, Mary Gichuru<sup>c</sup>

<sup>a</sup>*Department of Sociology and Anthropology, University of Windsor, 401 Sunset Avenue, Windsor, Ont., Canada N9B 3P4*

<sup>b</sup>*4610 Sleaford Road, Bethesda, MD 20814, USA*

<sup>c</sup>*P. O. Box 64455, 00620 Nairobi, Kenya*

## Abstract

This study examined the impact of a primary-school HIV education initiative on the knowledge, self-efficacy and sexual and condom use activities of upper primary-school pupils in Kenya. A quasi-experimental mixed qualitative–quantitative pre- and 18-month post-design using 40 intervention and 40 matched control schools demonstrated significant program impact on targeted objectives of (1) adequate program delivery and, for standard 6 and 7 pupils (ages 11–16 years), (2) increased HIV-related knowledge; (3) increased communication with parents and teachers about HIV and sexuality; (4) increased assistance to fellow pupils to avoid sexual activity; (5) increased self-efficacy related to abstinence and condom use; (6) decreased exposure to HIV through delayed first intercourse, decreased sexual activity and increased condom. Results support the conclusions that the existing infrastructure is adequate for national roll-out of the program; that the program has its most beneficial effect on sexually inexperienced youth and should therefore be implemented with the youngest age groups possible; and that gains are gender specific, with boys reporting increased condom use while girls are more likely to decrease or delay sexual activity. Based on these results, the program began national roll-out to all primary schools in 2005. By June 2006, the program was operating in 11,000 of the country's nearly 19,000 schools.

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*Keywords:* HIV intervention; School-based program; Kenya; Youth

## 1. Introduction

AIDS continues its spread in much of sub-Saharan Africa (SSA), with youth among the most vulnerable population (Monasch & Mahy, 2006). The optimistic rallying cry that *prevention works* (UNAIDS, 2005) holds great hope and promise. Support for the cry is found in systematic reviews of programs targeting youth in developing countries, including those delivered in geographically bounded communities (Maticka-Tyndale & Brouillard-Coyle, 2006), in schools in SSA (Gallant & Maticka-Tyndale, 2004) as well as in developing countries overall (Kirby, Obasi, & Laris, 2006), through mass media (Bertrand & Anhang, 2006) and through youth-friendly

health services (Dick et al., 2006). To date, however, almost all of these programs have remained small-scale, with few reaching beyond limited, local populations (Dick, Ferguson, & Ross, 2006). Such limited delivery has continued, despite both the UNGASS (2001) call for initiatives to reach 95% of youth by 2010 and the 2005 UNAIDS report stressing the urgent need to scale up and intensify prevention efforts that work (UNAIDS, 2005). Clearly, knowing that prevention works is a far cry from ensuring that prevention initiatives are mobilized to reach vulnerable populations.

This paper reports evaluation results for a school-based educational initiative designed to reach all upper primary-school pupils in Kenya with HIV education and prevention programming. Primary School Action for Better Health (PSABH) is a teacher-led and peer-supported primary-school HIV intervention. It was developed by CfBT Education Trust, Kenya based on field experience, baseline

\*Corresponding author. Tel.: +1 519 253 3000x2200;  
fax: +1 519 971 3621.

E-mail address: maticka@uwindsor.ca (E. Maticka-Tyndale).

research and the principles of social learning (Bandura, 1977, 1994) and scripting theories (Maticka-Tyndale et al., 2005). PSABH was designed for delivery using local resources and infrastructure, to fit within national guidelines on HIV and AIDS education, and with specific attention to the capacity of the education system. The primary outcome goal for the country was a sustainable program that was acceptable to teachers, communities and the Ministry of Education, Science and Technology (MoEST). The primary outcome goal for pupils was to reduce risk of HIV infection by delaying first sexual intercourse, decreasing sexual activity, and, for those who were sexually active, increasing condom use.

### 1.1. Challenges of school-based programming in SSA

Two recently published reviews cover 18 school-based HIV interventions evaluated in schools in SSA<sup>1</sup> (Gallant & Maticka-Tyndale, 2004; Kirby et al., 2006). Between them the reviews identified three key challenges that had to be met for programs to become operational on a large scale: gaining teacher and community buy-in, overcoming or ameliorating prejudices or limitations in teaching skills especially resistance among teachers to dealing with matters of sexuality, and meeting the resource limitations of local regions (Gallant & Maticka-Tyndale, 2004; Kirby et al., 2006). Raising community awareness of the HIV risk faced by youth, negotiating the content of school programs and providing teachers with training to discuss matters of sexuality and HIV were identified as essential to gaining teacher and community buy-in. Setting a curriculum with clear, consistent messages and training for delivery helped ameliorate teacher prejudice and limitations in teaching skills. Even when these were in place, however, both reviews noted that resistance to inclusion of information and skills building related to condom use was common. Gallant and Maticka-Tyndale (2004) described such resistance in 4 programs. In one (Klepp et al., 1994), refusal to include condoms was supported by national guidelines and in the others by teachers' fears that they would be fired if they spoke about condoms (Kinsman et al., 2001; Shuey, Babishangire, Omiat, & Bangarukayo, 1999; Visser, 1996). In three of these programs, information about condoms was either removed from the program or teachers themselves refused to include it. In one, poor up-take was thought to be influenced by teacher resistance to the condom component, even though this component was identified as "optional" for program delivery (Kinsman et al., 2001). Similar problems with introducing condoms have been noted in community-based interventions in SSA (e.g. MacPhail & Campbell, 2001; Maticka-Tyndale & Brouillard-Coyle, 2006).

<sup>1</sup>Kirby et al.(2006) included PSABH in their review. PSABH results have not been included in this overview in order to provide a point of comparison for this article.

The final key challenge faced by all programs in these reviews was human and material resources. Teaching and learning resources and infrastructure supports such as electricity, furniture or water are often scarce, pupil-to-teacher ratios are high and attendance of pupils and teachers may be erratic, especially in regions heavily affected by AIDS (World Bank, 2001). Interventions that require infrastructural support or supplies that are not readily available, those that are delivered outside of the regular school curriculum or rely on extra work or special efforts on the part of teachers, and those that depend on interactions between teachers and small groups of pupils, encountered resistance from schools and teachers because of the additional workload (Gallant & Maticka-Tyndale, 2004).

Only one of the interventions included in these reviews was designed to be sustained indefinitely (Shuey et al., 1999), the remainder were of short duration or of very limited capacity, with no consideration given to their reach, to delivery over a large geographical area or to replication or sustainability beyond the evaluation phase. Most interventions produced gains in knowledge and communication about HIV. Several also produced changes in attitudes and self-efficacy related to sexual and condom use behaviors. Fewer produced behavior changes, with only 4 of the 10 that measured changes in sexual behavior and 4 of the 7 that measured changes in condom use producing at least some change in the direction of reducing risk of acquiring HIV (see Gallant & Maticka-Tyndale, 2004; Kirby et al., 2006 for specific references).

## 2. Context of this study

### 2.1. National context of PSABH

Acceptance of PSABH by local schools and communities was facilitated by national support for school-based HIV/AIDS education. Between 1999 and 2000, the Kenyan Institute of Education produced an approved syllabus and texts for teaching about HIV and AIDS in primary schools. In January 2001 the MoEST mandated the teaching of one AIDS lesson a week and in July 2002 announced that questions on HIV and AIDS would be added to national primary-school examinations. While this officially placed HIV in the primary-school curriculum, neither teacher training to mobilize the new curriculum nor a pedagogy for teaching about sexuality and HIV were developed. PSABH was able to fill this void. In order to facilitate local acceptance of a curriculum that dealt with the highly contentious and sensitive issues of sexuality and HIV, PSABH was designed to be consistent with national guidelines and to maximize use of components of curricula already operating in schools. To insure that teachers across the country could be trained in its delivery and that it could be delivered in all schools, it used the MoEST infrastructure for teacher training and program delivery and only those resources typically available in Kenyan primary

schools. Since the central question was whether the program could effect desired changes when implemented under routine conditions of school operation, the program was delivered and evaluated under normal everyday conditions.

Nyanza Province, bordering Lake Victoria and located in western Kenya, was selected as the first location for program delivery because of the high HIV prevalence in this region (Ministry of Health, 2001). As the training infrastructure was strengthened and expanded and preliminary evaluation results demonstrated the feasibility of program delivery, PSABH training was spread to new regions, moving from regions of higher to those of lower prevalence.

## 2.2. Primary-school action for better health: program development and description

PSABH provides in-service training for primary-school teachers and pupil peer supporters to deliver an HIV education intervention to upper primary-school youth (standards 6 and 7; with most between 11 and 16 years of age) as part of the regular school curriculum.

### 2.2.1. Theoretical and experiential foundations of PSABH

The pedagogy of PSABH was based on social learning theory with role modeling, practice of desired behaviors and activities for building self-efficacy included together with didactic instruction (Bandura, 1977, 1994). Information about the scripting of sexual encounters among youth, cultural beliefs and the structure of gendered and social relationships was obtained through pre-program focus group discussions with youth and in-depth interviews with teachers and community leaders (Maticka-Tyndale et al., 2005). The content and focus of learning activities were based on this information and included challenges to beliefs about the irrepressible nature of male sexual drive and the impossibility of abstaining from sexual activity, the teaching of skills to enhance self-efficacy related to following alternative pathways to those represented in the dominant cultural scripts for sexual encounters, and the development of critical thinking skills to address considerable misinformation about condoms.

Surveys and interviews with teachers identified both a lack of information and considerable misinformation, taboos against most adult-child communication about sex and difficulties reconciling contradictory beliefs about youth, sexuality and condoms. As a result, training focused on a pedagogy of delivering correct information; helping teachers to reconcile contradictory beliefs about youth, sexuality and condoms; adult-child communication; and teaching critical thinking skills (CfBT Education Trust, 2006; Maticka-Tyndale, Gallant, Brouillard-Coyle, & Sverdrup-Phillips, 2002).

### 2.2.2. Program delivery and content

The teaching and learning materials produced by the Kenyan Institute of Education, a training manual (CfBT Education Trust, 2006), Q&A Booklet (CfBT Education Trust, 2005a) and School Health Club Activity Kit (CfBT Education Trust, 2005b), the latter three produced by CfBT Education Trust and approved by the MoEST, were the primary resources used in PSABH. These manuals and resources fully outline and illustrate the curriculum content and pedagogy of the program and are available on the web ([www.psabh.info](http://www.psabh.info)). Integrated teams of MoEST and Ministry of Health (MoH) personnel were trained to deliver training to teachers and peer supporters and to monitor and support program delivery. This built capacity and a collaborative relationship between the two ministries, contributing to sustainability.

After sensitization of each participating community to the need for an HIV prevention program in the primary school, the head teacher, a senior classroom teacher and one community representative from each intervention school were trained in 2 week-long residential sessions separated by a school term. Four peer supporters and another teacher participated in a final week-long residential training session. To test the capacity of MoEST personnel and infrastructure to deliver the program on a large scale, training was provided for nearly 1500 schools in two provinces in 2002.

Teachers were trained to train colleagues in their home schools, to infuse and integrate HIV education throughout classroom subjects and to provide guidance and counseling on HIV-related topics. In addition, teachers and pupil peer supporters learned to use anonymous question boxes, school health clubs, information corners and other school activities such as assemblies, drama, music and literary performances to facilitate learning about HIV and AIDS. Beyond information about HIV transmission, prevention and progression, program content addressed strategies and skills building for resisting the social, cultural and interpersonal pressures to engage in sexual intercourse, sessions to combat stigmatization of people living with or affected by HIV and care of people with AIDS.

Considerable resistance to teaching about condoms as a method to prevent HIV was evident in pre-program research and discussions with teachers. Teachers feared that telling youth about condoms would encourage them to be sexually active and provide them with an excuse not to take the abstinence message seriously. Since pre-program research also demonstrated that a considerable proportion of pupils in the target grades were already sexually active, CfBT staff and lead trainers challenged trainers and teachers to find a risk reduction strategy for sexually active youth. Three strategies were proposed: encouraging youth to stop engaging in sex (referred to as secondary virginity), providing information about condoms in response to their questions and bringing health workers into schools to discuss condoms. Although teachers did not include condoms in regular lesson plans, they did learn to respond



to questions about condoms with factual information rather than morally laden messages. Pupil questioning was actively encouraged through use of an anonymous question box, school health club and various classroom and co-curricular activities. MoH and PSABH trainers worked with local health workers to train them in communicating with youth about sexuality and condoms and they were provided with encouragement and support to visit schools in their regions for this purpose. Although MoEST guidelines prohibited provision of condoms in schools, community surveys and both pre- and post-program questionnaires with youth established that condoms were available to them through social marketing programs, government facilities, non-government organizations and commercially. Youth knew where to get condoms and did not feel that accessing condoms was a problem.

Unlike many school-based interventions that are designed for limited time periods during the school year (e.g. 7 or 14 hours of instruction during the year) (Gallant & Maticka-Tyndale, 2004; Kirby et al., 2006), PSABH activities and lessons were designed to be on-going components of the school curriculum with Education Officers trained to monitor the PSABH activities in their schools along with their regular monitoring functions.

### 2.2.3. PSABH objectives

The primary objectives against which PSABH was evaluated included:

- 1) To deliver an HIV education intervention to upper primary-school pupils that was integrated into regular classroom teaching and also used diverse co-curricular activities.
- 2) For pupils to:
  - a) increase HIV-related knowledge,
  - b) increase communication with parents and teachers about HIV, AIDS and sexuality,
  - c) increase assistance to each other to avoid sexual activity,
  - d) increase self-efficacy with respect to: (i) abstaining from sexual intercourse; (ii) using condoms,
  - e) decrease potential exposure to HIV by: (i) delaying first sexual intercourse; (ii) decreasing sexual activity; (iii) increasing condom use.

## 3. Evaluation methods

Initiation of program delivery in Nyanza province was accompanied by program evaluation using a quasi-experimental, pre- and 18-month post-intervention evaluation design. Data were collected in self-completion surveys and focus group discussions with standard 6 and 7 pupils; in surveys and interviews with teachers; and in mid-term monitoring reports of Education Officers (see Table 1 for timeline).

### 3.1. Sample selection

Forty pairs of schools in Nyanza Province, matched for school district and academic standing were used in this evaluation. Schools in each pair were randomly assigned to intervention and control conditions. Of the schools invited for training in the initial phase of program delivery, 92.5% sent a full complement of teachers, community representatives and peer supporters to training. Only these schools were included in the evaluation. Control schools received the MoEST guidelines for HIV/AIDS education but had no PSABH trained teachers or peer supporters in the school during the 18-month evaluation period. They were, however, included in a training session immediately following the evaluation period.

Data were collected before and 18 months after the first teacher training session. The head or deputy head teacher and a classroom teacher, as well as all standard 6 and 7 pupils in attendance on data collection days completed surveys.<sup>2</sup> Sixteen focus groups were held pre- and eight post-intervention with a total of 160 girls and 160 boys from 24 participating schools. Forty-eight interviews were held with teachers from the same schools. Schools selected to provide focus group participants represented intervention and control sites, each of the two dominant ethnic groups (Luo and Kisii), and schools with high and low academic performance. Sample sizes are reported in Table 1.

At 4 and 16 months post-training, Education Officers completed monitoring instruments in each intervention and control school. These were completed as part of regular visits made to monitor school programs.

### 3.2. Data collection and handling

A multi-lingual team administered surveys and conducted focus groups. Survey questions were read aloud in English and the most commonly used local language as pupils, separated into same-sex classrooms, followed along on their own copies of the surveys (text in English and the local language) and marked their answers. Sex-segregated focus groups were conducted in a combination of English and the preferred local language of participants and took place in a private location in the school compound. All were tape recorded with permission of the participants. Surveys required approximately 1 h to complete and focus group discussions likewise took approximately 1 h. Questionnaires and monitoring instruments were optically scanned into an SPSS database. Focus group discussions were transcribed and translated to English by the interviewers with translation verified by supervisory staff.

<sup>2</sup>Free Primary Education was declared at the beginning of the 2nd year that PSABH was operating in schools (January 2003). This produced a large influx of pupils into schools who had not been present over the full evaluation period. Although all pupils completed survey instruments, only responses of those present throughout the program were used in the evaluation.

Table 1  
Timeline of intervention and evaluation

Date	Intervention activity	Evaluation activity
1999–2000	Pilot test of delivery and content of program	
Jan. 2001	Ministry of Education, Science & Technology (MoEST) announces mandatory 1 AIDS lesson/week	
2001	Consultation with Kenya Institute of Education on development of teaching and learning materials	
2001	MoEST distributes outline of recommended HIV/AIDS topics	
Mid 2001	Community sensitization of participating schools and communities	
Oct. 2001		Pre-program surveys: <i>N</i>
		School                      Pupils
		Control                      40                      1705
		Intervention                      40                      1747
Feb.–Mar. 2002		Pre-program focus groups: <i>N</i>
		School                      Pupils
		Control                      8                      40
		Intervention                      8                      40
April 2002	PSABH training course A: 2 teachers and 1 community representative from each intervention school	
May 2002	Trained teachers initiate program in intervention schools	
July 2002	MoEST announces questions on HIV/AIDS will be on national primary examinations.	
July 2002		Education Officers conduct first monitoring in all participating schools
Aug. 2002	PSABH training course B: 2 teachers and 1 community representative from each intervention school	
Dec. 2002	PSABH peer supporter training: 4 pupil peer supporters and 1 teacher from each intervention school	
Jan. 2003	Initiation of free primary education	
July 2003		Education Officers conduct second monitoring in all participating schools
Oct. 2003		Post-program data collection: <i>N</i>
		Schools                      Pupils
		Control
		Surveys                      40                      1976
		Focus groups                      4                      40
		Intervention
		Surveys                      40                      1964
		Focus groups                      4                      40

### 3.3. Ethics

The research protocol was reviewed by the office of the Provincial Director of Education for Nyanza Province and by the University of Windsor, Canada Research Ethics Board. Given the number of orphans and children not under the regular care of parents in the schools and the considerable stigmatization of families affected by HIV, we were advised by school and community representatives that the process of individually obtaining parental consent would potentially discriminate against participation of children affected by HIV and would also contribute to their identification and stigmatization. As a result, following a community meeting where the PSABH approach was presented, schools, in consultation with their local School Committees which included representation of parents, exercised their authority to grant research team access to the pupils and to permit pupils to make their own decisions

about research participation.<sup>3</sup> To prevent unintended disclosure of orphan status during the more informal, in-depth focus group discussions, AIDS orphans were not invited to participate in focus groups. Information relevant to obtaining pupil consent was provided in oral and written form prior to each data collection activity.

### 3.4. Research instruments

Focus groups engaged pupils in discussions of “how sex happens”; norms related to communication, sexual activity and condom use; knowledge about HIV transmission and prevention; and local discourse about abstinence, sexual partners, condoms and sexual experiences of their cohort. In addition, the meanings that pupils attached to concepts and questions in the survey were explored. Post-program

<sup>3</sup>This approach is more fully described in Maticka-Tyndale (2004).

focus groups also addressed delivery of program components.

The questionnaire was developed based on the WHO/UNESCO HIV Prevention Evaluation Kit (WHO, 1999). Several questions about abstinence and condom self-efficacy were only approved by the Provincial Director of Education for inclusion in the post-intervention data collection. These are identified in the analyses.

*Control variables:* Information on pupil socio-demographic characteristics included: age, gender, ethnic group, religion and socio-economic status (SES), the latter based on a locally derived measure.

*Independent variable:* The primary independent variable, *net program effect* was captured in the interaction between identification of the school as intervention or control and data as collected pre- or post-intervention. This controlled for pre-program control-intervention school differences and gains made in control schools over the evaluation period.

*Outcome and dose response measure:* Program delivery was both the first outcome objective and was used in assessing dose response for pupil outcomes. As an outcome variable it was measured based on Education Officer monitoring and also based on self-reports of pupil exposure to program components. The latter consisted of the summation of positive responses to questions about whether HIV and AIDS were included in 9 possible classroom subjects and whether a question box, school health club and information corner were operating in the school. Scores were dichotomized into high and low exposure using a cut-point of reporting exposure to 6 or more of the 12 items, at least one of which had to be either the question box of the school health club. This latter measure was also used as an indicator of program dosage to assess dose response, referred to as *exposure effect* in Tables 4–6.

*Outcome variables:* Knowledge about HIV transmission and prevention was dichotomized into pass/fail based on responding correctly to 9 or more of 18-true/false items (this coincides with what is required for a passing grade on examinations in Kenya).

Abstinence and condom self-efficacy were measured dichotomously based on responses of *definitely yes* or *yes* compared to responses of *not sure*, *no* and *definitely no* accompanying each of the following statements:

- *Abstinence:* I can: (a) say “no” to sex; (b) have a boyfriend or girlfriend for a long time and not play sex.<sup>4</sup>
- *Condom:* (a) A condom should be used each time you play sex;<sup>5</sup> (b) I can tell my boyfriend or girlfriend about using condoms (see footnote 4); (c) If I must play sex I can make sure a condom is used (see footnote 4).

<sup>4</sup>This question was only included post-program.

<sup>5</sup>While this statement assesses a norm rather than self-efficacy, since it was the only statement about condoms approved for both the pre- and post-test measure it is included here.

Pupil *behaviors* were measured as yes/no responses that in the past year a respondent had: (a) helped a friend avoid a situation where they might become involved in sexual intercourse; (b) asked a question in the school question box; (c) asked a teacher a question about HIV or AIDS; (d) spoken to a parent about HIV, AIDS or sexuality. Pupils were also asked whether they had: (a) engaged in sexual intercourse in the past 3 months; (b) used a condom (boys) or made sure a condom was used (girls) at last intercourse.

Timing of sexual initiation was measured based on the length of time pupils had been sexually active. Those who had been sexually active for less than 12 (standard 6 pupils) or 18 (standard 7 pupils) months were categorized as initiating sexual activity during the program or over an equivalent time period.

### 3.5. Data analysis

Comprehension of question content was checked by including questions with parallel content but using slightly different wording and by exploring pupil understanding of concepts in focus group discussions. After completing screening for reliability and validity, logistic regressions were conducted for each outcome indicator. Socio-demographic, pre-post and control-intervention indicators were controlled with the *program effect* reported as an adjusted odds ratio. The pupil exposure variable was used as an indicator of program dose with the adjusted odds ratio for *exposure effect* used as an indicator of dose response for pupil outcomes. What must be considered in interpreting results is that while the research design supports the conclusion that a significant relationship of *program effect* to outcome measures may be considered causal, this is not the case for *exposure effect*. Since PSABH is an on-going intervention, there is no end-point at which exposure is fixed and influences outcomes that occur or are sustained to a later time point. Instead, exposure is coincident with the development of knowledge, formation of attitudes and engagement in particular behaviors with each having the possibility of influencing the other. This necessitates caution in interpretation of the *exposure effect*.

Logistic regressions were conducted separately for males and females with and without any sexual intercourse experience prior to program initiation.<sup>6</sup> Bootstrapping was used with the WESVAR statistical package to control for the effects of the clustered sampling design.

Analysis of focus group transcripts was facilitated using N6 Software. Transcripts were thematically coded and focus group text was compared to survey responses. Questionnaire responses from schools contributing pupils to focus groups were compared on all outcome measures to those from all other schools to identify potential school-level biases in the sample of schools that contributed focus group participants. No statistically significant differences were found.

<sup>6</sup>Referred to as NVPP or non-virgin pre-program and PPV or pre-program virgin.

## 4. Results

### 4.1. Sample profile

The sample of pupils (Table 2) included nearly equal proportions of males and females with a median age just over 14 years. The dominance of Christian religions, Luo and Kisii ethnic groups and low SES reflect the regional profile (Central Bureau of Statistics, 2005). Approximately half of the youth reported they were sexually experienced at baseline. Patterns of sexual experience were similar for males and females and increased with age from 37.5% of 11–12-year-olds to over 60% of 16–17-year-olds. Although schools were randomly assigned to intervention and control groups, there were statistically significant differences in the demographic profiles of students in these groups. All demographic variables were therefore controlled in logistic regressions to account for any effects they might have on outcomes.

### 4.2. HIV/AIDS lessons in schools

At pre-program data collection, 10 months following the MoEST directive that all schools include one AIDS lesson a week, teachers in over 80% of both control and intervention schools reported the presence of such lessons.

Table 2  
Profile of pupil samples completing surveys pre- and post-program

	Control schools		Intervention schools	
	Pre-program	Post-program	Pre-program	Post-program
<i>N</i>	1705	1976	1747	1964
% male (%)	48.8	44.4	50.8	52.9
Ethnic group				
Luo (%)	51.6	51.4	65.7	65.7
Kisii (%)	44.9	44.2	32.1	30.9
Religion				
Catholic (%)	41.0	40.0	47.2	48.4
Protestant (%)	52.8	53.4	49.0	47.9
Age				
Range (years)	11–16	11–16	11–16	11–16
Mean	14.15	14.15	14.25	14.31
Median	14	14	14	14
SES				
Range	22–100	22–100	22–100	22–100
Mean	57.09	57.88	55.72	56.00
Median	54.54	54.54	54.54	54.54
Ever engage in sexual intercourse (%)	48.6	45.2	54.2	43.0

Note: with the exception of engaging in sexual intercourse, all intervention–control differences at both pre- and post-program were significantly different at  $p \leq .001$  using either chi-square or independent samples *t*-tests. For sexual intercourse, the only significant difference is between pre- and post-program percentages in intervention schools ( $p \leq .001$ ).

The majority of teachers in all schools, however, complained of deficits in curriculum guidelines, knowledge and skills to teach these lessons. At the 18-month post-program data collection, there was a significant reduction in the percentage of teachers in control schools (to 49%) reporting delivery of the weekly lessons. This compared to substantial increases in intervention schools in the delivery of these designated HIV and AIDS lessons, as well as in the incorporation of information about HIV and AIDS into other classroom subjects and in co-curricular activities promoted as part of PSABH training. These results coincided with July 2002 and 2003 monitoring reports (4 and 16 months after teacher training) of Education Officers who found half or more of the program activities operating in 81% and 86%, respectively of the intervention but only 24% and 28%, respectively of the control schools. They are also consistent with the adjusted odds ratios in Table 3 which show that pupils in intervention schools were over three times as likely as those in control schools to report high levels of exposure to overall teaching about HIV and AIDS. The question box, a pedagogical strategy specifically taught as part of PSABH, was the co-curricular activity that demonstrated the greatest divergence between control and intervention schools.

In focus groups it was the question box and school health club that pupils most often commented on as particularly meaningful and helpful. The question box provided pupils with the opportunity to ask about more contentious issues, such as condoms. Pupils found trained teachers to be supportive of such questioning, providing

Table 3  
Adjusted odds ratios from logistic regression for pupil exposure to PSABH program in schools

	Males		Females	
	PPV	NVPP	PPV	NVPP
<i>N</i>	(2165)	(1466)	(2778)	(973)
<i>High pupil exposure</i>				
Program effect				
OR	3.77***	3.26***	3.53***	3.46***
(95% CI)	(2.35–6.03)	(1.71–6.24)	(2.39–5.21)	(1.89–6.36)
<i>Question box in school</i>				
Program effect				
OR	3.77***	6.02***	5.70***	6.68***
(95% CI)	(2.60–5.48)	(3.75–9.65)	(4.05–8.01)	(3.69–12.10)
<i>School health club in school</i>				
Program effect				
OR	2.90***	3.85***	1.70***	1.76*
(95% CI)	(1.99–4.23)	(2.42–6.13)	(1.24–2.34)	(1.02–3.02)

Note: Each line represents a separate logistic regression. \* $p \leq .05$ ; \*\* $p \leq .01$ ; \*\*\* $p \leq .001$ .

PPV—pre-program virgin; NVPP—non-virgin pre-program.

Program effect consists of the interaction between identification of a school as intervention or control and data as collected pre- or 18 months post-teacher training.

Odds ratios adjusted for age, standard, ethnic group, SES and religion.



what they considered to be useful information in their answers.

When we ask about condoms [in the question box], we are told that if we have sex we must use them (Girls).

Question box has got very different questions even the ones you had never thought of. That's why it's good (Boys).

In some schools, the entire community was given access to the question box, extending PSABH's educational role beyond the school.

The question box is placed outside the office so that even parents can write and put questions any time ... [The questions are answered] twice a week, ... they invite parents, pupils and teachers. (Girls)

In response to specific questions about how they found lessons that included HIV content, on average, 65–80% of pupils rated the lessons about HIV/AIDS as very useful; having told them everything they needed to know; having helped them make the right decisions; and having helped them protect themselves from disease. Only a minority (30–40%) found the lessons to be difficult to understand; a bit shameful; or boring.

#### 4.3. Knowledge, communication and helping others

Table 4 shows net program and exposure effects on knowledge, communication and helping friends to avoid sexually enticing situations. Only PPV boys demonstrated significant knowledge gains that could be ascribed to the program—in this case both to the presence of the program in their schools and to levels of program exposure. The lack of gains in knowledge for other subgroups is perplexing in light of focus group discussions where pupils were consistently able to correctly list ways in which HIV could be acquired and prevented, to logically and accurately discuss alternative interpretations of HIV risk, and to *debunk* myths which had predominated pre-program. Pupils regularly recited a formula for remaining “safe” from sexual transmission:

It is simple, abstain until marriage, before marriage get tested, wait 6 months and get tested again, stay faithful to your husband/wife.

We were told to avoid sex until marriage, which is after school. After taking her you don't have sex until you are both tested. If you are both clean then you can get married (Boys).

The differences between survey and focus group results have several possible explanations. The focus group portion of the research relies on a small sample of youth selected because of their willingness to participate in group discussions. These may, therefore, represent the most knowledgeable and sophisticated youth. However, the same selection procedures were used at both waves of data collection and for focus groups in both intervention and

Table 4

Adjusted odds ratios from logistic regression for knowledge, communication and helping others

	Males		Females	
	PPV	NVPP	PPV	NVPP
<i>N</i>	(2165)	(1466)	(2778)	(973)
<b>Over 50% correct on knowledge scale</b>				
Program effect				
OR	1.59*	1.13	.75	.72
(95% CI)	(1.01–2.50)	(.64–1.99)	(.51–1.11)	(.38–1.37)
Exposure effect				
OR	1.58***	1.02	1.12	1.12
(95% CI)	(1.19–2.10)	(.74–1.41)	(.90–1.40)	(.90–1.40)
<b>Communication</b>				
<i>Asked a teacher a question about HIV/AIDS</i>				
Program effect				
OR	1.88***	1.18	2.82***	1.35
(95% CI)	(1.28–2.77)	(.73–1.93)	(2.01–3.96)	(.77–2.36)
Exposure effect				
OR	1.99***	1.93***	1.93***	1.34
(95% CI)	(1.54–2.56)	(1.44–2.59)	(1.58–2.36)	(.97–1.85)
<i>Talked to a parent about HIV/AIDS</i>				
Program effect				
OR	1.43	1.27	1.98***	1.78*
(95% CI)	(.99–2.06)	(.80–2.01)	(1.41–2.78)	(1.03–3.07)
Exposure effect				
OR	1.84***	1.65***	1.57***	1.17
(95% CI)	(1.47–2.30)	(1.27–2.15)	(1.29–1.92)	(.86–1.60)
<b>Helped a friend avoid a situation of high risk for sexual activity</b>				
Program effect				
OR	1.26	.74	1.07	.84
(95% CI)	(.87–1.82)	(.88–1.84)	(.77–1.48)	(.48–1.45)
Exposure effect				
OR	1.44**	1.21	1.30**	1.30
(95% CI)	(1.15–1.80)	(.93–1.58)	(1.08–1.57)	(.94–1.78)

Note: \* $p \leq .05$ ; \*\* $p \leq .01$ ; \*\*\* $p \leq .001$ .

PPV—pre-program virgin; NVPP—non-virgin pre-program.

Program effect consists of the interaction between identification of a school as intervention or control and data as collected pre- or 18 months post-teacher training.

Exposure effect coded 0 for low exposure (pupil reports of HIV/AIDS teaching in fewer than 6/12 possible courses or co-curricular activities); 1 for high exposure (pupil reports of HIV/AIDS teaching in 6 or more of 12 possible subjects or co-curricular activities, including at least one of the question box or school health club).

All odds ratios adjusted for age, standard, ethnic group, SES and religion.

control schools. The difference in how pupils at pre- and post-program and in intervention and control schools (post-program) spoke about HIV and AIDS suggests that the program did contribute positively to pupil knowledge. A second possibility is that the open-ended nature of focus group discussions allowed pupils to explain, discuss and reason through various conflicting possibilities to help them arrive at correct answers. Survey questions require an answer without the possibility of considering different contexts. Considering both possible explanations, it appears that at least some pupils gained in knowledge and critical thinking skills from the program and that, at least in group discussions, they were able to demonstrate an

ability to arrive at a “correct” formula for HIV prevention. Whether these gains were made by all pupils and are not well represented in responses to closed-ended survey questions is not known.

PSABH had a positive impact on communication with both parents and teachers. With only one exception, positive program and/or exposure effects were present for communicating with parents and teachers about HIV and AIDS for all subgroups of pupils. The exception was NVPP girls for whom there were no gains in communication with teachers. The strong focus that teachers placed on abstinence, supported by a stronger societal support for abstinence among girls than boys, may have made girls with sexual experience reluctant to communicate with teachers about their HIV concerns, for fear that they would be judged negatively for their sexual history.

It is interesting to note that the program only had an affect on the reports of PPV pupils that they had helped a friend avoid a situation where they were likely to be enticed into sexual activity. For both boys and girls without sexual experience, those who reported high levels of exposure to the program were more likely to report providing such help to friends. It appears that this program message had no impact on pupils who were already sexually experienced at program initiation.

#### 4.4. Self-efficacy and sexual behaviors

Baseline research demonstrated poor abstinence self-efficacy among both boys and girls. In focus groups, pupils described how a boyfriend or girlfriend was expected in upper primary school and the necessity of sexual activity in such relationships (Maticka-Tyndale et al., 2005). In Table 5, differing subgroup results are evident for changes in abstinence self-efficacy as well as for sexual behaviors, suggesting that boys and girls with and without a history of sexual intercourse responded differently to strategies for establishing an alternative script.

##### 4.4.1. Girls

For girls, the greatest gains in self-efficacy were among those who were already sexually experienced when the program began. In this subgroup, there were statistically significant *program effects* increasing the likelihood that girls reported they could “say ‘no’ to sex” and could “have a boyfriend and not play sex.” Considering that these girls were already sexually experienced, these gains represented a major shift in their perceptions of their ability to follow an alternative pathway from that prescribed in the dominant sexual script (Maticka-Tyndale et al., 2005). These gains in self-efficacy did not, however, translate into changes in recent sexual activity (i.e. within the past 3 months).

In contrast, there was little evidence of change in the abstinence self-efficacy of girls who were abstaining from sexual activity at the beginning of the program. The only evidence of a strengthening of abstinence self-efficacy in

Table 5  
Adjusted odds ratios from logistic regressions for self-efficacy and sexual behaviors

	Males		Females	
	PPV	NVPP	PPV	NVPP
<b>Abstinence self-efficacy</b>				
(N)	(2150)	(1459)	(2760)	(970)
<i>I can say ‘no’ to sex</i>				
Program effect				
OR	1.15	.87	1.36	1.84**
(95% CI)	(.80–1.65)	(.55–1.36)	(.99–1.88)	(1.07–3.19)
Exposure effect				
OR	1.18	1.14	1.28**	1.04
(95% CI)	(.94–1.48)	(.88–1.48)	(1.07–1.54)	(.76–1.42)
<i>I can have a BF/GF and not play sex<sup>a</sup></i>				
Program effect				
OR	1.10	.85	.97	1.59*
(95% CI)	(.84–1.46)	(.64–1.14)	(.77–1.21)	(1.01–2.54)
Exposure effect				
OR	1.25	1.46**	1.05	.74
(95% CI)	(.94–1.66)	(1.08–1.96)	(.83–1.32)	(.46–1.17)
<b>Sexual behaviors</b>				
<i>Sexual debut during program<sup>b</sup></i>				
(N)	2150		2760	
Program effect				
OR	.71*		.59***	
(95% CI)	(.48–.98)		(.47–.73)	
Exposure effect				
OR	1.32*		1.27	
(95% CI)	(1.03–1.69)		(.99–1.64)	
<i>Sexual intercourse in past 3 months<sup>c</sup></i>				
(N)	(568)	(1450)	(464)	(973)
Program effect				
OR	1.82	1.51	.55*	.84
(95% CI)	(.89–3.73)	(.94–2.43)	(.24–.98)	(.46–1.52)
Exposure effect				
OR	1.26	.87	1.06	1.27
(95% CI)	(.83–1.90)	(.67–1.14)	(.66–1.71)	(.87–1.86)

Note: \* $p \leq .05$ ; \*\* $p \leq .01$ ; \*\*\* $p \leq .001$ .

PPV—pre-program virgin, NVPP—non virgin pre-program.

Program effect consists of the interaction between identification of a school as intervention or control and data as collected pre- or 18 months post-teacher training.

Exposure effect coded 0 for low exposure (pupil reports of HIV/AIDS teaching in fewer than 6/12 possible courses or co-curricular activities); 1 for high exposure (pupil reports of HIV/AIDS teaching in 6 or more of 12 possible subjects or co-curricular activities, including at least one of the question box or school health club).

Odds ratios adjusted for age, standard, ethnic group, SES and religion.

<sup>a</sup>Asked post-program only.

<sup>b</sup>Compared to same time period pre-program.

<sup>c</sup>Asked only of those who have engaged in sexual intercourse.

this group was among girls who had high program exposure. These girls were more likely to report that they could “say ‘no’ to sex.” However, there was no increase in confidence that they could have a boyfriend and not play sex.

Self-efficacy is merely a step towards maintaining abstinence. A program effect was responsible for lowering the proportion of PPV girls who initiated sexual activity as

well as the proportion who reported sexual activity in the most recent 3 months. There is, however, a puzzling association between pupil reports of program exposure and sexual debut, with a nearly significant increase in debut among girls with high as compared to low program exposure. Since the time ordering of debut and exposure cannot be established, we cannot be certain whether higher exposure led to debut or girls who initiated sex searched out greater involvement in the program, perhaps as a source of information and skills building in relation to sex.

In focus group discussions girls described the strategies they were learning for maintaining abstinence. These included clear communication about their intentions:

When a boy approaches you for friendship you have the right to tell him that you are still in school and you do not want to hear about sex.

avoiding boyfriend/girlfriend relationships;

After all, you don't need a boyfriend, they aren't like air [which you need to breathe].

or being prepared to leave a relationship.

If he is your boyfriend and forces you then you can refuse.

Q: How?

You separate.

Q: What other way can somebody refuse?

Not accepting gifts.

Q: Can somebody refuse to be forced?

Suppose you have a boyfriend then he forces me into sex then I can refuse.

Q: How are you going to refuse?

*I'll refuse talking to him* (Girls. Post-program focus group).

This represented a substantial shift from the dialogue in pre-program focus groups where girls spoke of the necessity of a boyfriend, of pressuring each other to have boyfriends and of the inevitability of sex as part of a boyfriend/girlfriend relationship. However, despite these apparent shifts in girls' ability to manage cross-gender relationships, they still described situations where boys would force or coerce them to have sex if they resisted, especially if they attempted to maintain a relationship with a boyfriend but were not prepared to engage in sex with him.

Sometimes they [boyfriends] can still overpower you.

#### 4.4.2. Boys

As with girls, there was only evidence of change in abstinence self-efficacy among NVPP boys. In this case, however, rather than a clear program effect, the change was associated with program exposure. NVPP boys who reported high program exposure were more likely than those reporting low exposure to also report that they could,

“have a girlfriend and not play sex.” The difficulty in determining the time ordering of these two variables means that we cannot be certain about whether high levels of program exposure preceded the development of this conviction, whether those who developed such a conviction sought out greater involvement in the program, or whether there was a reflexive relationship between developing a sense of self-efficacy and higher levels of program exposure.

The results for sexual activity paralleled those for girls. PPV boys in intervention compared to control schools were less likely to initiate sexual activity during the program. Here again we see the puzzling association between pupil reports of program exposure and sexual debut.

In focus group discussions, both pre- and post-program, boys spoke of sexual activity as resulting from drives or urges that had to be satisfied. Pre-program boys consistently spoke of these drives as uncontrollable and of dealing with them through hetero-sexual intercourse. Post-program, however, boys were able to provide examples of strategies they used to avoid such “urges.”

Don't go out and start talking or smiling at any girl who is well dressed and take her to your home.

They also spoke of how to deal with these “urges” without engaging in intercourse.

The body at times pushes you and wants you to have sex with a girl ... if you feel that, you go somewhere and work so that your body can cool down.

You find a hoe and you dig and dig and dig.

Boys presented these as situational and temporary alternatives to sexual activity and spoke of long-term abstinence as impossible. They also felt that avoiding or handling sexual desires in these ways was only possible for boys who had not yet engaged in sex. Once a boy had, “tasted the sweetness [of sex] it is impossible to resist,” “even if he misses only one day, he will feel sick.”

#### 4.5. Self-efficacy and use of condoms

Given the relatively high rates of pre-program sexual activity (see Table 2) and the view, at least among boys, that abstinence is temporary, education on using condoms to reduce the risk of acquiring HIV seems to be essential. Teaching about condoms was predominantly in response to pupil questions in the question box or school health club. Education Officers' monitoring reports supported the conclusion that in intervention sites pupils were persistently asking questions about condoms in the school question box and that these were being answered factually. Interviews with teachers, however, suggested that teachers were conveying information but not endorsing condom use for primary-school pupils (Table 6).

Table 6  
Adjusted odds ratios from logistic regressions for self-efficacy and condom use

	Males		Females	
	PPV	NVPP	PPV	NVPP
<b>Condom self-efficacy</b>				
(N)	(2150)	(1459)	(2760)	(970)
<i>If you 'play sex' you should use a condom</i>				
Program effect				
OR	1.40	.98	1.02	.57*
(95% CI)	(.97–2.62)	(.62–1.56)	(.73–1.40)	(.33–.98)
Exposure effect				
OR	1.31*	1.28	1.42***	1.28
(95% CI)	(1.04–1.66)	(.98–1.68)	(1.18–1.72)	(.93–1.77)
<i>I can tell my BF/GF about using condoms<sup>a</sup></i>				
Program effect				
OR	.91	1.10	.87	.62*
(95% CI)	(.88–1.22)	(.80–1.50)	(.70–1.09)	(.40–.97)
Exposure effect				
OR	1.54***	1.41**	1.40***	1.08
(95% CI)	(1.15–2.06)	(1.02–1.96)	(1.12–1.76)	(.70–1.68)
<i>If I play sex I can make sure we use a condom<sup>a</sup></i>				
Program effect				
OR	1.15	1.17	.80	.76
(95% CI)	(.85–1.57)	(.84–1.62)	(.64–1.01)	(.47–1.23)
Exposure effect				
OR	1.37*	1.03	1.29**	1.40
(95% CI)	(1.00–1.88)	(.73–1.44)	(1.02–1.61)	(.87–2.25)
<b>Condom use</b>				
<i>A condom was used the last time engaged in sexual intercourse<sup>b</sup></i>				
(N)	(510)	(1327)	(354)	(708)
Program effect				
OR	.98	.89	.86	.95
(95% CI)	(.46–2.09)	(.53–1.52)	(.33–2.23)	(.49–1.86)
Exposure effect				
OR	1.56*	1.47*	.98	1.27
(95% CI)	(1.01–2.41)	(1.09–2.00)	(.57–1.67)	(.87–1.86)

Note: \* $p \leq .05$ ; \*\* $p \leq .01$ ; \*\*\* $p \leq .001$ .

PPV—pre-program virgin; NVPP—non virgin pre-program.

Program effect consists of the interaction between identification of a school as intervention or control and data as collected pre- or 18 months post-teacher training.

Exposure effect coded 0 for low exposure (pupil reports of HIV/AIDS teaching in fewer than 6/12 possible courses or co-curricular activities); 1 for high exposure (pupil reports of HIV/AIDS teaching in 6 or more of 12 possible subjects or co-curricular activities, including at least one of the question box or school health club).

Odds ratios adjusted for age, standard, ethnic group, SES and religion.

<sup>a</sup>Asked post-program only.

<sup>b</sup>Asked only of those who have engaged in sexual intercourse.

#### 4.5.1. Girls

There was no evidence of a positive program effect on condom self-efficacy for girls. In fact, what is disturbing is that there is a *reduction* in condom self-efficacy for NVPP girls, precisely the group with an immediate need for condoms for self-protection. High program exposure was, however, associated with increased self-efficacy among PPV (although not NVPP) girls. While the direction of

causality for this latter result cannot be established, recall that high program exposure scores were only obtained when pupils reported the presence of a question box and/or school health club, precisely the places where learning about condoms took place.

The different self-efficacy outcomes for PPV and NVPP girls may relate to how differences in sexual experience affect girls' responses to the focus on abstinence that was present in classroom teaching. The experience of PPV girls resonated with the focus on abstinence. They were responding to questions about condoms without an experiential base since they had not yet engaged in sexual intercourse. It appears that the information provided about condoms contributed to their sense of self-efficacy with respect to condom use. This was reflected in focus group discussions where girls spoke of what they would do when they became sexually active.

We need to know about condoms for when we become sexually active. When you play sex you must use condoms.

Q: What if he [a future boyfriend] refuses to use a condom?

You say, "no condom, no sex."

In contrast, NVPP girls came to the program with experience in sexual encounters and potentially in condom negotiation and use. What they heard from their teachers was that they were at risk of infection. Condoms could reduce that risk, but not completely, and were not the best alternative for protection. They came to this information with experiences similar to those described in focus groups.

He says [in response to a suggestion of condom use], "What do you think, I'm infected?"

If you talk about condom he thinks you are infected or he thinks you are trying to avoid playing sex.

They [boys] don't like condoms. If you insist he will refuse and he can beat you.

It is not surprising that girls who may have already had experience with the difficulties of introducing condoms into their sexual relationships became less confident in their ability to use condoms in response to an approach that conveys factual information about condoms but also discourages condom use. Combined with the absence of any improvement in reports of condom use at last intercourse, this result is particularly troubling and suggests that the program, as designed and delivered, is not meeting the HIV prevention needs of sexually active upper primary-school girls.

#### 4.5.2. Boys

Boys demonstrated more program-related gains in condom self-efficacy. As with girls, these gains were more common among PPV than NVPP boys. In all cases, these were associated with high exposure to the program and not merely the result of having the program present in their school. The same is the case for use of condoms, with high



program exposure for both PPV and NVPP boys associated with higher reports of condom use at last intercourse. Although high exposure was only recorded if a question box or school health club were operating in the school, suggesting that it was such exposure that influenced self-efficacy and use, we cannot be certain about the causal direction.

Detailed discussion of condoms was more common in boys' than girls' focus groups both pre- and post-program. Boys were more aware of condoms and spoke more of their views of condom use. At pre-program there was considerable confusion and uncertainty about whether condoms were beneficial to protecting them against HIV infection. Post-program, boys not only were consistent in their view that condoms could protect against HIV, but were also able to correct the myths and misinformation that were commonly heard about the dangers of condom use.

#### 4.6. Limitations

While evaluation results support a positive conclusion for the acceptance of PSABH in communities and schools and its ability to deliver an effective program, the limitations of the evaluation must be recognized. These include: the cross-sectional sample, the introduction of previously out-of-school youth at the beginning of the 2nd year of the program, reliance on self-report outcome measures, absence of blinding and single province testing of the intervention.

The cross-sectional sample precluded testing the causal order of theoretical relationships or the durability of effects over time. This was evident, for example, with respect to *exposure effect* where conclusion about causal order could not be drawn. The durability of effects is of particular concern since we do not know for how long the depressed rates of sexual debut will continue or whether condom use by boys will remain elevated. Ultimately it is sustained low-risk behaviors which are necessary to protect individuals and to lower the incidence of HIV infection. However, collection of valid longitudinal data poses serious problems. Tracking young people once they have left primary school is difficult in Kenya since a large proportion do not continue on to secondary school and mobility is high. What must be acknowledged in drawing conclusions about this program is that the repeated cross-sectional design used here supported conclusions about the durability of the program's effect for pupils attending school over the course of two school years, but not assessment of its durability once these youth left school.

The declaration of free primary education starting January 2003 brought a large influx of youth who had limited or no prior education into the schools. On average, schools participating in the evaluation increased their student body by 30%, with students doubling in some. This posed a considerable challenge to schools to integrate these new pupils, accommodate their educational needs and find space for growing classes. To insure that only

those pupils who had the full benefit of 18 months of the program were included in the evaluation, pupils who were not in school over this full time period were excluded from the evaluation. While this controlled for program exposure in the evaluation sample, what cannot be assessed is the impact that this influx of students had on the program and its outcomes.

Questions have been raised about the susceptibility of reports of sexual behavior to desirability bias (Cleland & Ferry, 1995), particularly when testing an intervention designed to influence perceptions of the acceptability of sexual behaviors and condom use. Objective measures such as HIV or STI incidence have been recommended as more valid indicators of program-related effects. However, HIV and STI data are not routinely collected on primary-school youth and, even in regions of high prevalence, incidence in this population is low with acquisition of HIV through sexual behavior potentially confounded with parent-child transmission (e.g. Chagalucha et al., 2003). In designing this evaluation, the sample size required to use HIV or STI incidence, the cost of collecting the necessary data and the ethical dilemmas posed by such data collection led to the decision to use self-reports of behaviors. Questionnaires were made available in English and the main local language of the school and multi-lingual survey administrators read questions to pupils in both languages. These approaches were used to minimize bias or unreliability resulting from inadequate comprehension. In addition, the veracity of behaviors reported by pupils and the meanings they ascribed to different concepts were explored in the more detailed and extensive discussions in focus groups.

The absence of blinding may have introduced bias into results. Blinding of control schools and data collection staff was judged to be unfeasible in this project. Informing all schools of the nature, purpose and procedures of the evaluation was necessary to gaining compliance from control schools. Once schools were aware of their status in the evaluation, it was impossible to fully blind data collection staff. Only data collection supervisors were aware, however, of the status of each school. Unless this information was shared with data collection staff by the head teacher, they were unlikely to know which of the schools they were approaching were control and which intervention sites.

#### 5. Lessons learned

The strength of using both quantitative survey data from a large sample and more in-depth qualitative data from youth reflecting, elaborating on and discussing topics that parallel those on a survey is illustrated here. The survey results were essential to both identifying patterns and trends that were present before and after the intervention and to testing the intervention's impact for specific subgroups of pupils. In collecting the qualitative results, pupils had the opportunity to explain their thinking and experiences in greater detail. This provided important

insights into the meanings of the statistical results and the extent, limitations, and reasons for some of the statistical results that were evidenced. For example, it was focus group discussions that demonstrated considerable confusion and contradictory information and beliefs related to condoms prior to the program and a clearer and more consistent understanding 18 months after the program began. While the questionnaire suggested only some improvement in knowledge, the discussion among students in focus groups and the resulting resolution of contradictory information demonstrated the beginning of critical thinking skills. Qualitative data also demonstrated limitations to the survey results. For example, although self-efficacy in sexual matters demonstrated an increase in surveys, in focus groups girls spoke of how the persistence of male sexual force set a limitation to their empowerment.

Research results were presented to MoEST and donor agency staff and representatives following pre-program data collection and again at the end of the evaluation. Both the statistical and the qualitative, textual, data proved important in these presentations. The pre-program statistical data on levels of knowledge and especially on the proportion of pupils engaging in activities that placed them at risk of HIV infection provided compelling reasons for the Ministry to continue support for the initiative, even though it dealt with subjects that raised concerns among influential stakeholders. It similarly provided reasons for the donor agency to remain committed to the national roll-out of the program, should it prove effective. The post-program statistical results demonstrating the changes evidenced in pupils provided the evidence needed by both the Ministry and the donor agency that they had made the right decision. However, it was the words of the girls and boys in talking about sexual practices, risk, beliefs and relationships that gave those who knew the young people of Kenya confidence that they were hearing from the youth of their country. They heard young people speaking in familiar ways, telling stories of experiences which the adults knew to be true. For teachers and community members it was the textual data, the words of the youth, that were most compelling and convincing and motivated them to rise to the challenge of dealing with issues that were particularly difficult for them.

Lessons were also learned about delivery of the program, in particular about the need to train more trainers and teachers in order to compensate for personnel loss. Over the 2 academic years that PSABH was in place, 22% of the trained teaching staff was lost either to transfer, retirement or death. Based on this, four, rather than the original two, teachers were trained in each school as the program was moved into new regions of the country. Preliminary data suggest that this has insured that all schools retain at least two trained teachers.

## 6. Discussion and conclusions

PSABH achieved each objective for at least one, and usually several, of the four major subgroups of youth. The

results also provided insights into differential responses to the program by these subgroups. Results parallel those in other school-based programs in SSA (Gallant & Maticka-Tyndale, 2004; Kirby et al., 2006), including greater gains overall for sexually inexperienced than experienced youth, greater gains related to abstinence for girls and condom use for boys. The greater number of beneficial results for pre-program virgins supports the need for early HIV programming, before youth are likely to be sexually active. The reduction in the proportion of pupils who reported sexual initiation for pre-program virgins and increase in condom use for boys was consistently the most positive results of evaluations that measured these outcomes in the reviews by Gallant & Maticka-Tyndale (2004) and Kirby et al. (2006). The skills-based approach of PSABH went beyond the knowledge and attitudes approach of most other programs. From pupil reflections on the actions they took and how they used what they had learned, such an approach appears suited to providing youth with what they need in order to take up desirable behaviors.

The problems identified in other SSA programs with community and teacher buy-in, especially related to the condom content (Gallant & Maticka-Tyndale, 2004; Kirby et al., 2006) were not experienced here. It is likely that community, school and teacher buy-in were facilitated by MoEST directives requiring one AIDS lesson a week, the alignment of PSABH with ministry teaching guidelines, the use of ministry approved materials, the careful attention paid to the sensitization of communities (including religious leaders), the inclusion of community representatives in training and the practice of bringing information from the research back to the Ministry, teachers and parents. Ministry guidelines were, however, silent on the place of condoms in the curriculum and no mention was made of them in the approved teaching materials. PSABH staff handled teacher concerns and resistance to teaching about condoms by challenging teachers and trainers to collaboratively find a way to meet the needs of pupils who were already sexually active. Teachers were encouraged to separate moral from factual messages with respect to condoms. While condoms were not included in regular lesson plans, Education Officers found evidence that teachers answered pupil questions during regular lessons and in the question box, and that health workers were visiting schools and teaching about condoms. It appears that this approach achieved a compromise that allowed teachers to maintain their preferred focus on abstinence while finding a way to bring information about condoms to youth. However, it is clear from evaluation results that while this approach contributed to improving information about condoms, and enhanced condom self-efficacy and use among boys, it was inadequate to meet the needs of those girls who were already sexually active.

The greatest shortcomings of the program appear to be in meeting the needs of sexually experienced girls. This was the only group of pupils whose communication with teachers did not improve and for whom the program

produced a decrease in condom self-efficacy. While this group of girls did demonstrate gains in abstinence self-efficacy, the fact that they were already sexually active and that there was no change in sexual activity in the 3 months prior to data collection, suggests they have pressing needs in the areas of condom self-efficacy and skills. In focus group discussions it was clear that the introduction of condoms into a relationship carries a serious reputational risk for girls, and may actually place them at risk for physical violence. Clearly, the focus on factual information about condoms coupled with a lack of endorsement for condom use, coupled with their own experiences, decreased their perception that condoms should be used and their confidence in their ability to introduce condoms into their relationships.

These results are but one example of the variability in responses found to this program based on gender and sexual experience. Girls generally gained more related to postponing, refusing and avoiding sexual activity while boys gained more in the area of condom use. Although this may have served the needs of boys and sexually abstinent girls for strategies to reduce their risk of exposure to HIV, it did not serve the needs of sexually active girls.

The results of this evaluation, together with teacher and school enthusiasm for the intervention evidenced in the rapid up-take of program components, demonstrates that local concerns and challenges to intervention delivery can be met. Following evaluation in five additional regions of Kenya (Maticka-Tyndale, Brouillard-Coyle, Egbo, Holland, & Metcalfe, 2006), with financial assistance from the Department for International Development, UK, PSABH began roll-out to all Kenyan primary schools. As of June 2006, using the infrastructure developed and tested during the evaluation reported here, 11,000 Kenyan schools had PSABH trained teachers and the infrastructure was mobilized to deliver the program to the remaining schools by the end of 2008. Program monitoring by MoEST Education Officers continues with monitoring results fed-back to schools.

It is widely recognized that while school-based programming cannot stand alone in combating the spread of HIV among youth (UNAIDS, 2005), schools provide a vehicle for reaching large numbers of youth. PSABH has demonstrated that if a school-based program is planned to reach a national scale, is built on knowledge of the local contexts, maximizes its use of local infrastructures, is supported by and responsive to research and evaluation, it can be delivered at a national level, reaching a large majority of youth and contributing to realization of the promise that *prevention works*.

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